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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHUNG, DAVID Y

ART UNIT PAPER NUMBER

2871

DATE MAILED: 03/18/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/782,524

Applicant(s)

PARK, KU HYUN

Examiner

David Y. Chung

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1, 2, 6-10 and 16-18 rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. 5,142,393) in further view of Hatano et al. (U.S. 6,320,629) and Mitsui et al. (U.S. 6,351,298).

As to claims 1, 8, 9 and 18, Okumura et al. discloses a liquid crystal device with a compensator having negative optical anisotropy. Note in figure 1, first and second substrates 21 and 22, liquid crystal layer 24, and optically anisotropic film 3. Okumura et al. discloses that the axis corresponding to N3e is in the direction approximately parallel to the surfaces of the substrates of the liquid crystal cell. Furthermore, a second optically anisotropic film can be added to the display as shown in figure 13.

Okumura et al. does not disclose a twist angle of at least 90 degrees. However, the liquid crystal layer was typically a twisted nematic or super-twisted nematic, both of which had a twist angle of at least 90 degrees.

Okumura et al. discloses an optically anisotropic film formed on the outer surface of the substrate instead of on the inner surface. However, both arrangements were well known functionally equivalent alternatives. Note quarter-wave plate 39 in figure 1 of Mitsui et al. Note phase difference regions 110 in figure 1 of Hatano et al. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to form the optically anisotropic film on the inner surface of the display because it was a well-known functionally equivalent alternative.

As to claims 2 and 10, Okumura et al. discloses transparent electrodes 23 and 25 in figure 1. Okumura et al. does not disclose an alignment layer formed over the transparent electrodes. However, alignment layers were conventionally used for applying a pre-tilt or pre-alignment condition to the liquid crystal layer in the absence of an electric field. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to provide an alignment layer over the transparent electrodes in order to apply a pre-alignment condition to the liquid crystal layer.

As to claims 6, 7, 16 and 17, Okumura et al. does not disclose intersecting gate and data lines with thin-film transistors at the intersections. However, these were conventional components of an active matrix display. Active matrix displays were well known and obvious for having fast response times and good viewing properties. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to create an active matrix display because of its fast response times and good

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viewing properties. Use of conventional elements provided the additional benefits of having well understood behavior and well established supply chains and manufacturing methodologies.

2. Claims 3, 4, 11 and 12 rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. 5,142,393) in further view of Hatano et al. (U.S. 6,320,629), Mitsui et al. (U.S. 6,351,298), Koma et al (U.S. 6,204,905) and Wu (Materials Chemistry and Physics).

Okumura et al. does not disclose a multi-domain liquid crystal display comprising a slit in the common electrode. However, Koma et al. discloses a vertically aligned multi-domain liquid crystal display comprising slits in the counter electrode. See figures 5 and 6. It was well known and obvious that multi-domain displays could be combined with compensators to create a wide viewing angle display. A teaching to this effect is found in the disclosure of Wu. Wu teaches that multi-domain displays achieve wide viewing angles by overcoming the reversed contrast problem. The film-compensated multi-domain display further extends the viewing angle. See page 1. Therefore, it would have been obvious to combine a multi-domain display with film-compensation in order to further extend the viewing angle as taught by Wu.

3. Claims 5 and 13 rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. 5,142,393) in further view of Hatano et al. (U.S. 6,320,629), Mitsui

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et al. (U.S. 6,351,298), Koma et al (U.S. 6,204,905), Wu (Materials Chemistry and Physics) and Shin et al. (U.S. 5,850,274).

Okumura et al. and Koma et al. do not disclose a multi-domain display with different alignment directions in each domain. However, Shin et al. discloses a multi-domain display with various alignment variations in figures 4A-7C. Shin et al. teaches that the disclosed device and fabrication method achieves wide viewing angle while introducing less impurities and improving fabrication yields. See column 2, lines 5-10. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to add the multiple alignments disclosed by Shin et al. to the devices of Okumura et al. and Koma et al. because of the improvements in viewing angle and fabrication yield.

4. Claims 5 and 13-15 rejected under 35 U.S.C. 103(a) as being unpatentable over Okumura et al. (U.S. 5,142,393) in further view of Hatano et al. (U.S. 6,320,629), Mitsui et al. (U.S. 6,351,298), Koma et al (U.S. 6,204,905), Wu (Materials Chemistry and Physics) and Kim et al. (U.S. 5,909,265).

As to claims 5, 13 and 14, Kim et al. discloses that two-domain TN LCDs and domain-divided TN LCDs with different alignment directions in each domain were conventional. See column 1, lines 20-35. Kim et al. further discloses that rubbing was a conventional method for creating an alignment condition in the alignment layer. See

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column 1, lines 35-45. Use of conventional elements or methods has associated benefits that include well-understood behavior and well-established supply chains and manufacturing methodologies. It would have been obvious to one of ordinary skill in the art at the time of invention to create different alignment directions in the multi-domain display of Koma et al. and to use rubbing to create the alignment condition because of the aforementioned benefits.

As to claim 15, Kim et al. discloses that the conventional rubbing method generates dust and discharge on the alignment layer causing damage to the substrate and resultant yield deterioration. See column 1, lines 45-50. Kim et al. teaches using photo-alignment in order to overcome the substrate damage problem. See column 1, lines 50-55. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to use photo-alignment to create an alignment condition in the alignment layer in order to avoid yield deterioration.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to David Chung whose telephone number is (703) 306-0155. The examiner can normally be reached on Monday-Friday from 8:30 am to 5:00 pm.

David Chung
GAU 2871
03/09/03

K
SUPERVISOR
TECHNICAL STAFF
2003